Amendments to the Claims

This listing of claims will replace all prior versions and listing on claims in the pending Application.

Listing of Claims

1. (Currently Amended) A process for the synthesis of phenol and acetone starting from cumene hydroperoxide, comprising the following steps with each step performed in a different reactor:

a) pretreating the starting cumene hydroperoxide with acidic resins, to obtain cumene hydroperoxide free of inorganic cations;

b) decomposing the cumene hydroperoxide free of inorganic cations originating from the step (a) in the presence of acidic resins, to yield phenol and acetone.

2. (Currently Amended) A process according to claim 1, wherein said step a) of pretreating cumene hydroperoxide with the acidic resins is performed at a temperature such as not causing a substantial decomposition of cumene hydroperoxide ~~CHP~~.

3. (Original) A process according to claim 1, wherein said step a) of pretreating the cumene hydroperoxide with the acidic resins is performed at a temperature below 20°C.

4. (Currently Amended) A process according to claim 1, wherein said step b) of decomposing the cumene hydroperoxide is performed at a temperature ~~comprised~~ between 35°C and 90°C ~~preferably between 40° and 50° C~~.

5. (Currently Amended) A process according to claim 1, wherein said acidic resin is employed both in the step (a) of pretreating as in the step (b) of decomposing the cumene hydroperoxide, in amounts ~~comprised~~ between 2% and 25% by weight with respect to the hourly flow rate of cumene hydroperoxide in each of the steps (a) of pretreating and (b) of decomposing, respectively.

6. (Currently Amended) A process according to claim 5, wherein said acidic resin is employed both in the step (a) of pretreating as in the step (b) of decomposing the cumene hydroperoxide, in amounts ~~comprised~~ between 5% and 15% by weight with respect to the hourly flow rate of cumene hydroperoxide in each of the steps (a) of pretreating and (b) of decomposing, respectively.

7. (Original) A process according to claim 6, wherein the amount of acidic resin is about 10% by weight with respect to the hourly flow rate of cumene hydroperoxide.

8. (Currently Amended) A process according to claim 1, wherein said acidic resin is chosen among ion exchange resins having sulphonic acid functional groups ($-SO_3H$) tied to an organic chain, ~~preferably to a polystyrene or syrene-divinylbenzene polymer~~.

9. (Currently Amended) A process according to claim 8, wherein said acidic resin is ~~chosen from the group Amberlyst 15™, Amberlyst 18™, and Nafion™~~ a sulfonic resin with a perfluoridated chain.

10. (Currently Amended) A process according to claim 1, further comprising a

step (c) of drawing a portion of the reaction mixture exiting the decomposing step (b) of the cumene hydroperoxide, a step (d) of cooling said portion of the reaction mixture at a temperature of 35°C to 45°C, ~~more preferably of about 40°C~~ and a step (e) of recirculating the same to the decomposing step (b).

11. (Currently Amended) A process according to claim 10, wherein the amount of product recycled according to steps (c), (d) and (e) is ~~comprised~~ between 80% and 95% by weight.

12. (Original) A process according to claim 1, further comprising a regenerating step for the acidic resin used in said step (a) of pretreating the cumene hydroperoxide.

13. (Currently Amended) A process according to claim 12, wherein said acidic resin regenerating step is performed by treating with a solution of sulphuric acid ~~preferably a sulfuric acid at 15% by weight~~.

14. (Currently Amended) The process according to ~~A plant for performing the process as outlined~~ in claim 1, comprising:

[[-]] providing a decomposing reactor (3) of the cumene hydroperoxide, containing a pre-established amount of acidic resin;

[[-]] providing at least one preatreatment reactor (1a, 1b) of the cumene hydroperoxide with said acidic resins, where said at least one pretreating reactor is set up upstream of said decomposing reactor (3);

[[-]] providing recirculating means (D, P) of a portion of the products of the

decomposing reaction to said decomposing reactor (3); optionally,

[[-]] providing heat exchanging means (5) set up downstream of said decomposing reactor (3) along the recirculating line of said portion of products of the decomposing reaction, optionally,

[[-]] providing cooling means of said decomposing reactor (3) and of said at least one pretreating reactor (1a, 1b).

15. (Currently Amended) The ~~A plant~~ process according to claim 14, comprising the provision of at least two pretreating reactors (1a, 1b) of cumene hydroperoxide with acidic resin, where said at least two pretreating reactors are set up in parallel and operating in an alternating manner.

16. (New) A process according to claim 1, wherein said step b) of decomposing the cumene hydroperoxide is performed at a temperature between 40°C and 50°C.

17. (New) A process according to claim 1, wherein said acidic resin is chosen among ion exchange resins having sulphonic acid functional groups ($-SO_3H$) tied to a polystyrene or styrene-divinylbenzene polymer.

18. (New) A process according to claim 10, wherein the amount of product recycled according to steps (c), (d) and (e) is about 90% by weight of the reaction mixture exiting from the decomposing step (b).

19. (New) A process according to claim 12, wherein said acidic resin regenerating step is performed by treating with a solution of sulphuric acid at 15% by weight.